

National Grid SA-CO **PRODUCTION FILE**

Contractor : ABB Contracting Co.

Project : SS 8709- 132/13.8kV in Alkha

Contract No : 11131113/00

Substation : 8709

**Subject : 132Kv Busbar Protection Set-
Relay Panel-1**

ABB



POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD.,
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : Assembly Drawing – +BBP2-1
[132KV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL]

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED _____
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

COVER SHEET

132KV BUSBAR PROT.N.MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

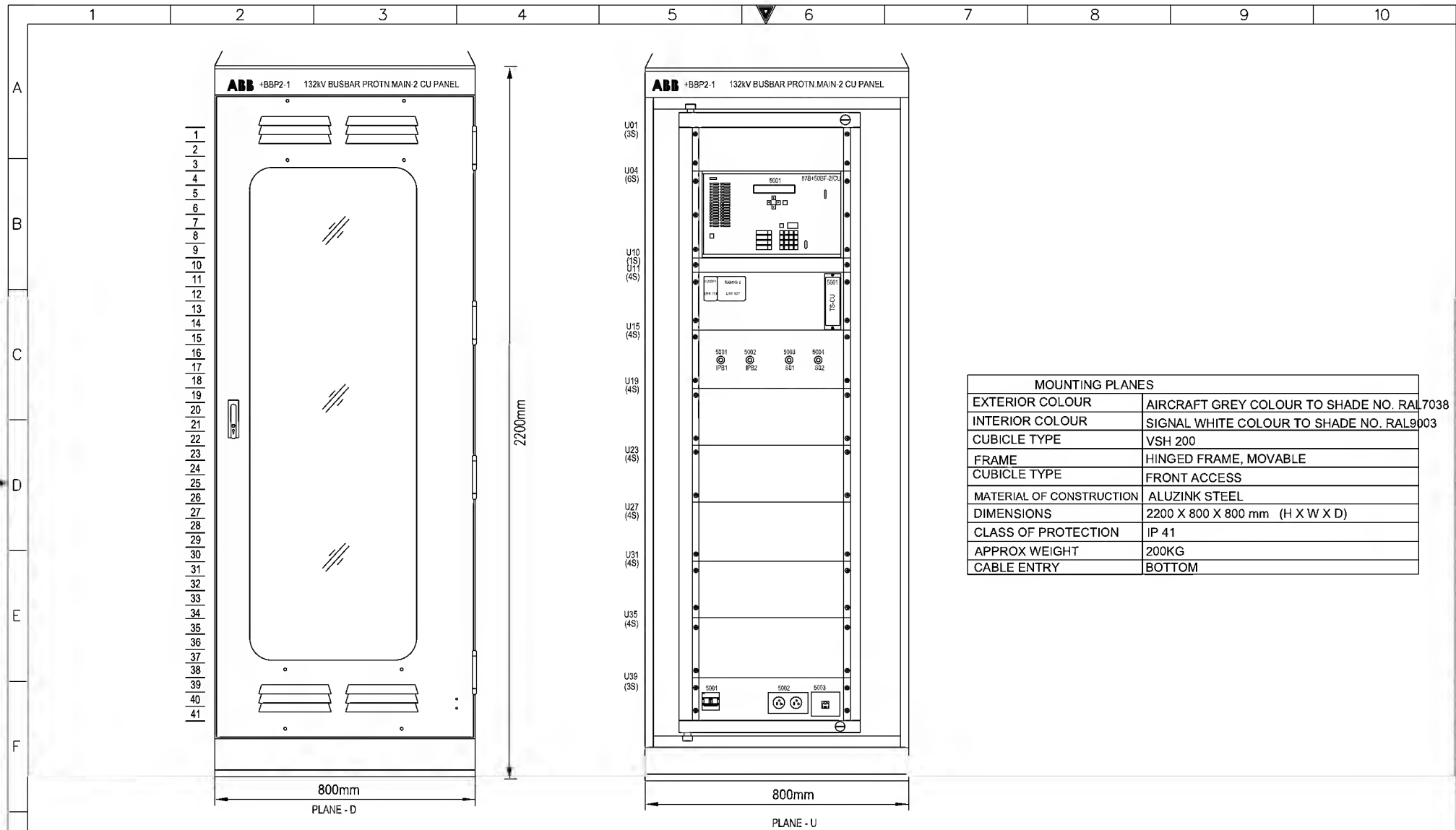
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323000	SHT CONT. 000/001	01

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

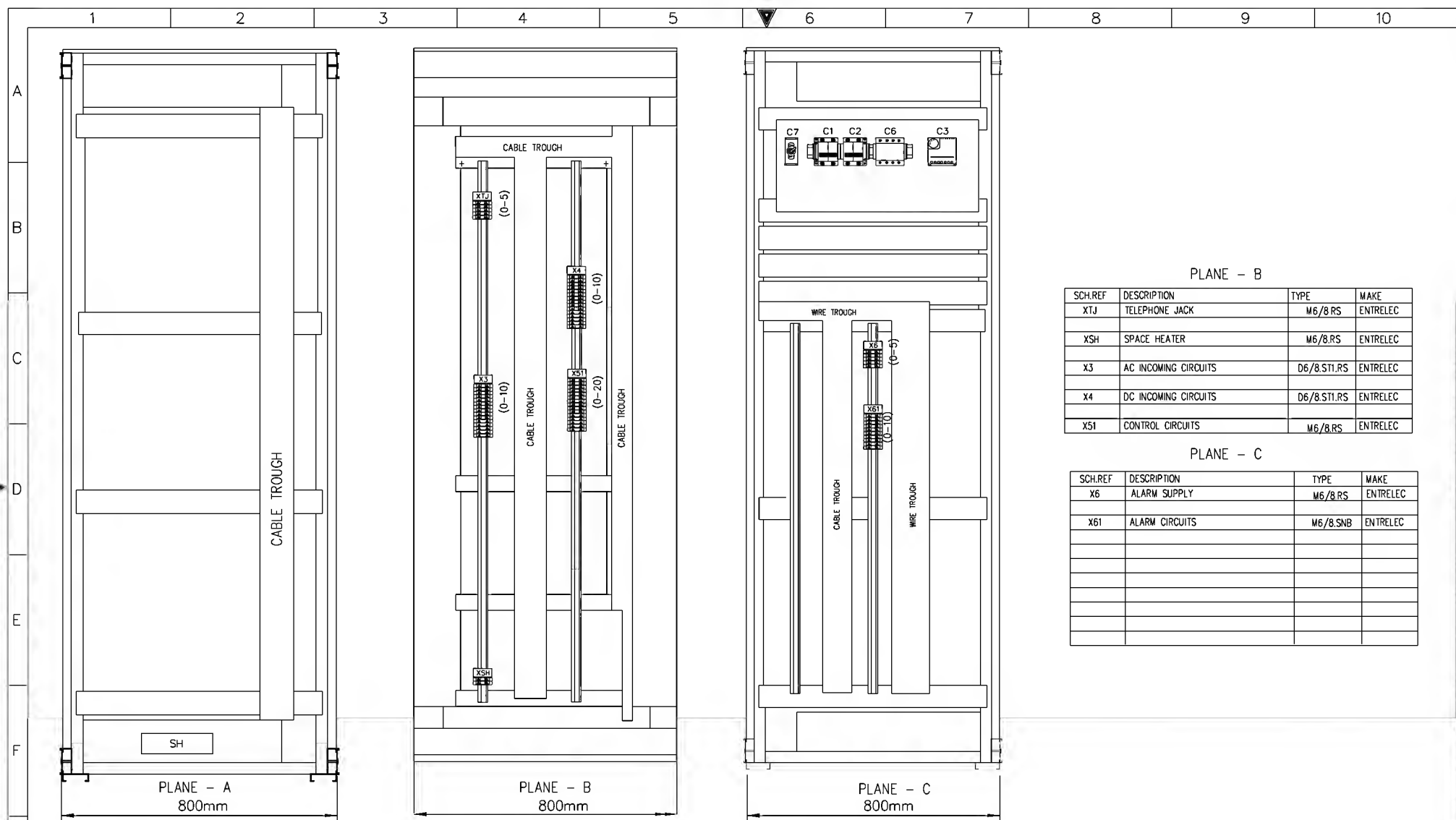


MOUNTING PLANES	
EXTERIOR COLOUR	AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038
INTERIOR COLOUR	SIGNAL WHITE COLOUR TO SHADE NO. RAL9003
CUBICLE TYPE	VSH 200
FRAME	HINGED FRAME, MOVABLE
CUBICLE TYPE	FRONT ACCESS
MATERIAL OF CONSTRUCTION	ALUZINK STEEL
DIMENSIONS	2200 X 800 X 800 mm (H X W X D)
CLASS OF PROTECTION	IP 41
APPROX WEIGHT	200KG
CABLE ENTRY	BOTTOM

AS-BUILT BY _____ DATE _____		CONTRACT NO. 1113113/00	JOB ORDER NO. S-13656	ASSEMBLY DRAWING		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
01	13 49	FACTORY ASBUILT		DRAWN BY RIZ	CHECKED BY KVR	132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		National Grid sa	
00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013	DATE COMPLETED _____	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.	
REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC	RIYADH SAUDI ARABIA		- C421 CD-323000 001 002 01	

NG/D2-D (2012/01)
DMS VECTOR NGD200

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PLANE - B

SCH.REF	DESCRIPTION	TYPE	MAKE
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X51	CONTROL CIRCUITS	M6/8.RS	ENTRELEC

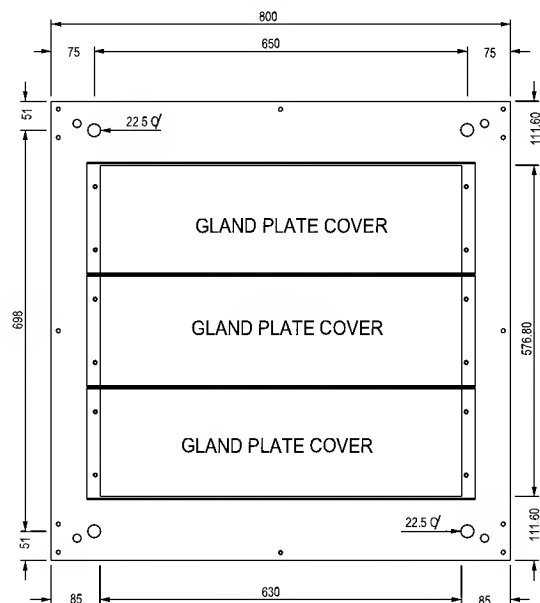
PLANE - C

SCH.REF	DESCRIPTION	TYPE	MAKE
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC

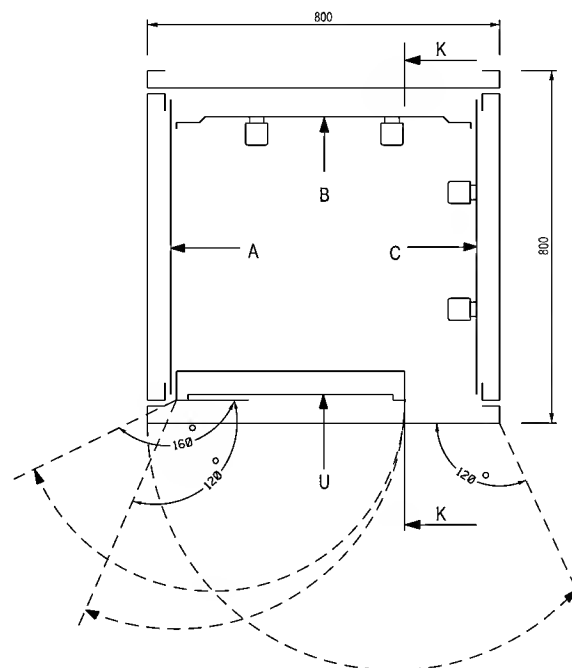
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
01 13 49			DRAWN BY RIZ		CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		INDEX		PLANT NO.	
00 13 04			DATE STARTED 24.01.2013		DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		DRAWING NUMBER		SHEET NO.	
REV. NO.			DATE		DESCRIPTION		PRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		SHT CONT.	
							RIYADH		SAUDI ARABIA		002003	
											01	

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BASE PLATE/
FOUNDATION



PLAN



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING				<div>نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA</div>				
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-i				INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.	REV. NO.	
01 13 49 FACTORY ASBUILT			DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY							SHT [CONT.			
00 13 04 FOR APPROVAL			OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA				-	C421	CD-323000	G03G04	01		
REV. NO. DATE DESCRIPTION															

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid SA

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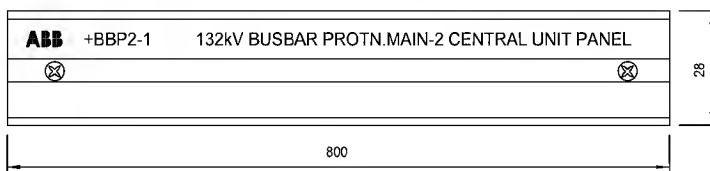
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G

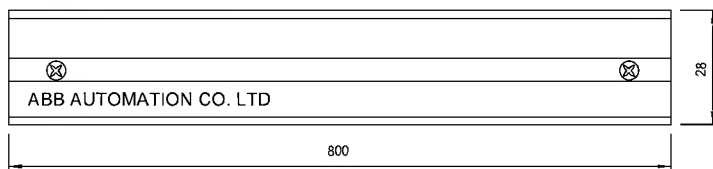


TOP VIEW FOR EARTHING BAR

U PLANE TOP LABEL



U PLANE BOTTOM LABEL



MANUFACTURING LABEL

ABB ABB Automation Co.Ltd.	
PROJECT :	National Grid SA S/S 8709
ORDER REFERENCE :	2875 RF S13656
YEAR OF MANUFACTURE:	2013
PANEL NO. :	+BBP2-1
DRAWING NO. :	S13656-CD-323000
MADE IN THE KINGDOM OF SAUDI ARABIA	

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING

132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323000	SHT 1 CONT.	01

NG/D2-D (2012/01)
DMS VECTOR NGD200



POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : LIST OF APPARATUS +BBP2-1
[132KV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL]

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

COVER SHEET

132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323000	L00L01	01

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

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A	SR. NO.	GA. REF.	SCH. REF.	DESCRIPTION		SHT.	QTY.	TYPE	MAKE	ORDERING INFORMATION
	1	U04.5001	87B+50BF-2/CU	RELAY CUBICLE- +BBP2-1 FOR 132KV BB/BF MAIN-2 ACCOMODATING THE FOLLOWING			1	VSH 200	ABB	
				CENTRAL UNIT FOR NUMERICAL BUSBAR PROTECTION WITH FOLLOWING		298	1	7SS522	SIEMENS	7SS5220-4AB92-KAO/HH
				HIGH RELIABILITY DUE TO TWO INDEPENDENT MEASUREMENT CRITERIA		299				
				STABILIZED DIFFERENTIAL CURRENT ALGORITHM						
				DIRECTIONAL CURRENT COMPARISON ALGORITHM						
				HIGH TROUGH FAULT STABILITY EVEN IN CASE OF CT SATURATION.						
				END FAULT PROTECTION						
B				FULL SOLID STATE BUSBAR REPLICA WITHOUT SWITCHING OF CT CIRCUIT,						
				THEREFORE NO CHECK ZONE REQUIRED						
				PHASE SEGREGATED MEASUREMENT						
				REDUCE CT PERFORMANCE REQUIREMENTS						
				BUILT IN EVENT RECORDER,BUILT IN EVENT DISTURBANCE RECORDER						
				BUILT IN HUMAN MACHINE INTERFACE,FULLY NUMERICAL SIGNAL PROCESSING						
C				BINARY INPUT : 12						
				BINARY OUTPUT : 16+2 WD						
				FULLY NUMERICAL SIGNAL PROCESSING						
				AUX. VOLTAGE : 110-125V DC						
				RATED FREQUENCY : 60HZ						
	2	U15.5001	IPB1	PUSH BUTTON FOR BUS IMAGE ALARM RESET		231	1	MP1-10B	ABB	1SFA 616 100 R1006
				BUTTON COLOUR : BLACK				MCBH-20		1SFA 616 600 R1102
D				CONTACT DATA : 1NO +1NC						
	3	U15.5002	IPB2	PUSH BUTTON FOR ALARM/INDICATION RESET		231	1	MP1-10B	ABB	1SFA 616 100 R1006
				BUTTON COLOUR : BLACK				MCBH-20		1SFA 616 600 R1102
				CONTACT DATA : 1NO +1NC						
E	4	U15.5003	S01	PUSH BUTTON FOR BBP IN SELECTION		232	1	MP1-10B	ABB	1SFA 616 100 R1006
				BUTTON COLOUR : BLACK				MCBH-20		1SFA 616 600 R1102
				CONTACT DATA : 1NO +1NC						
	5	U15.5004	S02	PUSH BUTTON FOR BBP OUT SELECTION		232	1	MP1-10B	ABB	1SFA 616 100 R1006
				BUTTON COLOUR : BLACK				MCBH-20		1SFA 616 600 R1102
				CONTACT DATA : 1NO +1NC						
F	6	U11.101	74DC-2/CU / SPARE	DUAL TARGET RELAY FOR 87B+50BF-2/CU DC SUPERVISION		232	1	RXSF 1	ABB	RK 271 019-AN
				AUXILIARY VOLTAGE : 110-125V DC						
				CONTACT DATA : 1NO + 2NC PER COIL						
				FLAG : SELF RESET						

G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء National Grid sa	
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		-	C421	CD-323000	SHT CONT.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA					L01 L02

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[illegible]

AS-BUILT BY _____	DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656
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			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>
01	13 49	FACTORY ASBUILT	DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____
00	13 04	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>

LIST OF APPARATUS	
132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP-2	
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		 نقل الكهرباء National Grid SA		
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT. CONT.	REV. NO.
-	C421	CD-323000	02. 03	01

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A	<table><thead><tr><th>SR. NO.</th><th>ITEM DESIGNATION</th><th>DESCRIPTION</th><th>SHEET.NO.</th><th>QTY.</th><th>TYPE</th><th>MAKE</th><th>ORDERING INFORMATION</th></tr></thead><tbody><tr><td>16</td><td>IL</td><td>INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W</td><td>211</td><td>1</td><td>T-4</td><td>SUNON</td><td>SP-20W</td></tr><tr><td>17</td><td>SH</td><td>SPACE HEATER, 55W, 127V, 60Hz</td><td>211</td><td>1</td><td>IFZEK7580104</td><td>IRICA</td><td>-</td></tr><tr><td>18</td><td>X3</td><td>SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS</td><td rowspan="8">301</td><td>10</td><td>D6/8.ST1.RS</td><td>ENTRELEC</td><td>1SNA 115 831 R0400</td></tr><tr><td></td><td>X4</td><td>SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC EXT. CIRCUITS</td><td>10</td><td>D6/8.ST1.RS</td><td>ENTRELEC</td><td>1SNA 115 831 R0400</td></tr><tr><td></td><td>X51</td><td>SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS-CENTRAL UNIT</td><td>20</td><td>M6/8.RS</td><td>ENTRELEC</td><td>1SNA 115 688 R2500</td></tr><tr><td></td><td>X6</td><td>SPRING LOADED TERMINAL BLOCK FOR ALARAM CIRCUITS</td><td>10</td><td>M6/8.RS</td><td>ENTRELEC</td><td>1SNA 115 685 R1200</td></tr><tr><td></td><td>X61</td><td>KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS</td><td>10</td><td>M6/8.SNB</td><td>ENTRELEC</td><td>1SNA 115 685 R1200</td></tr><tr><td></td><td>XTJ</td><td>SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK</td><td>4</td><td>M6/8.RS</td><td>ENTRELEC</td><td>1SNA 115 688 R2500</td></tr><tr><td></td><td>XSH</td><td>SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER</td><td>2</td><td>M6/8.RS</td><td>ENTRELEC</td><td>1SNA 115 688 R2500</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>B</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>C</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>E</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>F</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>G</td><td colspan="2">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">LIST OF APPARATUS</td></tr><tr><td></td><td>01</td><td>13 49</td><td colspan="2">FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ CHECKED BY KVR</td><td colspan="3">132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1</td></tr><tr><td></td><td>00</td><td>13 04</td><td colspan="2">FOR APPROVAL</td><td colspan="2">DATE STARTED 24.01.2013 DATE COMPLETED _____</td><td colspan="3">S/S 8709 - 132/13.8KV IN AL-KHARJ CITY</td></tr><tr><td></td><td>REV. NO.</td><td>DATE</td><td colspan="2">DESCRIPTION</td><td colspan="2">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td></tr><tr><td></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3">INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.</td></tr><tr><td></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3">- C421 CD-323000 L03NIL 01</td></tr><tr><td></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3">NG/D2-D (2012/01)</td></tr><tr><td></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3">DMS VECTOR NGD200</td></tr></tbody></table>										SR. NO.	ITEM DESIGNATION	DESCRIPTION	SHEET.NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	16	IL	INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W	211	1	T-4	SUNON	SP-20W	17	SH	SPACE HEATER, 55W, 127V, 60Hz	211	1	IFZEK7580104	IRICA	-	18	X3	SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS	301	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400		X4	SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC EXT. CIRCUITS	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400		X51	SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS-CENTRAL UNIT	20	M6/8.RS	ENTRELEC	1SNA 115 688 R2500		X6	SPRING LOADED TERMINAL BLOCK FOR ALARAM CIRCUITS	10	M6/8.RS	ENTRELEC	1SNA 115 685 R1200		X61	KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS	10	M6/8.SNB	ENTRELEC	1SNA 115 685 R1200		XTJ	SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK	4	M6/8.RS	ENTRELEC	1SNA 115 688 R2500		XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER	2	M6/8.RS	ENTRELEC	1SNA 115 688 R2500								B								C								D								E								F								G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS				01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1				00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA										INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.										- C421 CD-323000 L03NIL 01										NG/D2-D (2012/01)										DMS VECTOR NGD200		
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	X61	KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS		10	M6/8.SNB	ENTRELEC	1SNA 115 685 R1200																																																																																																																																																																																																												
	XTJ	SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK		4	M6/8.RS	ENTRELEC	1SNA 115 688 R2500																																																																																																																																																																																																												
	XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER		2	M6/8.RS	ENTRELEC	1SNA 115 688 R2500																																																																																																																																																																																																												
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G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS																																																																																																																																																																																																												
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1																																																																																																																																																																																																												
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY																																																																																																																																																																																																												
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA																																																																																																																																																																																																												
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POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD.
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : SCHEMATICS DRAWINGS – +BBP2-1
[132KV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL]

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED _____
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

COVER SHEET

132KV BUSBAR PROTN,MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323001	SHT CONT. 000/001	01

NG/D2-D (2012/01)

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CONTENTS	ABB SHT.NO.	REV.00	REV.01	REV.02
COVER SHEET	000	X	X	
CONTENTS SHEET	001	X	X	
GRAPHICAL SYMBOLS FOR DIAGRAMS	011	X	X	
GRAPHICAL SYMBOLS FOR DIAGRAMS	012	X	X	
COMMON LEGEND	013	X	X	
FERULE AND WIRING DETAILS	014	X	X	
DRAWING REFERENCES	015	X	X	
DRAWING REFERENCES	016	X	X	
DEVICE & WIRING REFERENCES	017	X	X	
AC SUPPLY FOR ILLUMINATION & POWER SOCKET	211	X	X	
CUB.LIGHTING,HEATER & SOKET ALARM CKT.	212	X	X	
DC SUPPLY DISTRIBUTION	216	X	X	
87B+50BF-2/CU PROTN. RELAY - BINARY INPUTS	231	X	X	
BBP IN/OUT SELECTION CKT.	232	X	X	
STATION COMMON ALARM	233	X	X	
87B+50BF-2/CU COMMUNICATION TO BAY UNITS	234	X	X	
87B+50BF-2/CU INTERNAL DIAGRAM	298	X	X	
87B+50BF-2/CU INTERNAL DIAGRAM	299	X	X	
TERMINAL BLOCKS +BB2-1	301	X	X	

G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		CONTENTS SHEET		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		National Grid sa			
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX		PLANT NO.	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		DRAWING NUMBER		SHEET NO.	
									- C421		CD-323001	
											SHT CONT.	
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											NGD200	

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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FUSE / LINK		WATTMETER		ELEMENT WITH NEGATED INHIBITING INPUT
	FUSE WITH THE SUPPLY SIDE INDICATED		VARMETER		ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION
	SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)		POWER FACTOR METER		ELEMENT WITH POSTPONED OUTPUT
	SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)		POSITION INDICATOR		AND-ELEMENT WITH TWO INPUTS
	SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC CORE		SYNCHROSCOPE		OR-ELEMENT WITH TWO INPUTS
	SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		RECORDING VOLTMETER		LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2
	SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		RECORDING WATTMETER		ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2"
	CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		HOURLY METER		EXCLUSIVE OR-ELEMENT WITH THREE INPUTS
	CURRENT TRANSFORMER WITH TWO CORES (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		WATT-HOUR METER		LOGIC IDENTITY ELEMENT WITH THREE INPUTS
	CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM		MAJORITY ELEMENT WITH THREE INPUTS
	FILTER		ELEMENT WITH STATIC INPUT		NEGATOR
	HIGH-PASS FILTER		ELEMENT WITH STATIC NEGATED INPUT		NAND ELEMENT WITH TWO INPUTS
	BAND-PASS FILTER		ELEMENT WITH STATIC NEGATED OUTPUT		NOR ELEMENT WITH TWO INPUTS
	VOLTMETER		ELEMENT WITH DYNAMIC INPUT		BISTABLE ELEMENT
	AMMETER		ELEMENT WITH DYNAMIC NEGATED INPUT		
			ELEMENT WITH INHIBITING INPUT		

AS-BUILT BY _____ DATE _____			CONTRACT NO. 1113113/00		JOB ORDER NO. S-13656		GRAPHICAL SYMBOLS FOR DIAGRAMS				الشركة الوطنية لنقل الكهرباء			
G				DRAWN BY <u> RIZ </u> CHECKED BY <u> KVR </u>		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1				National Grid SA				
	01 13 49 FACTORY ASBUILT			DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.				
	00 13 04 FOR APPROVAL									- C421 CD-323001 012/013 01				
	REV. NO. DATE DESCRIPTION			OPRG. DEPT. <u> CTPD </u> ENG. DEPT. <u> AUT-PSAC </u>		RIYADH SAUDI ARABIA								
										NG/D2-D (2012/01)				
										DMS VECTOR NGD200				

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LEGENDS

±CU
±BU/D07
±BU-D05

DC SUPPLY - CENTRAL UNIT CIRCUIT
DC SUPPLY - BAY UNIT-D07 CIRCUIT
DC SUPPLY - BAY UNIT-D05 CIRCUIT

CR
ECC
LOCAL
REMOTE

CONTROL ROOM
ENERGY CONTROL CENTRE
THE LOCATION OF CONTROLLED DEVICE
ANY OTHER LOCATION NOT LOCAL

ON
OFF
A
T
S
CS
CT
LS
LT
LC
LO
RO
OP
RE

CB NORMALLY OPEN AUXILIARY CONTACT
CB NORMALLY CLOSED AUXILIARY CONTACT
COMMON
TEST POSITION
SERVICE POSITION
CLOSE IN SERVICE POSITION
CLOSE IN TEST POSITION
LOCAL SERVICE
LOCAL TEST
LOCAL CLOSE
LOCAL OPEN
REMOTE OPEN
OPERATE
RESET

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE
2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS
2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS
1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS
2.5 SQ.mm. BLACK COLOURED FOR AC CIRCUITS
2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS
FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:
+ SIGN FOR DC + WIRE
- SIGN FOR DC - WIRE

LUGS

A. CT CIRCUITS- RING TYPE
B. OTHER CIRCUITS - SPADE TYPE

FERULLING

YELLOW TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES
(AS PER 31 - TMSS-1, RE.0)

AS-BUILT BY _____ DATE _____			CONTRACT NO. 1113113/00		JOB ORDER NO. S-13656		COMMON LEGEND				الشركة الوطنية لنقل الكهرباء National Grid sa			
01	13 49	FACTORY ASBUILT FOR APPROVAL	DRAWN BY RIZ		CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1				INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
00	13 04		DATE STARTED 24.01.2013		DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				-	C421	CD-323001	SHT CONT.
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA				013 014 01			

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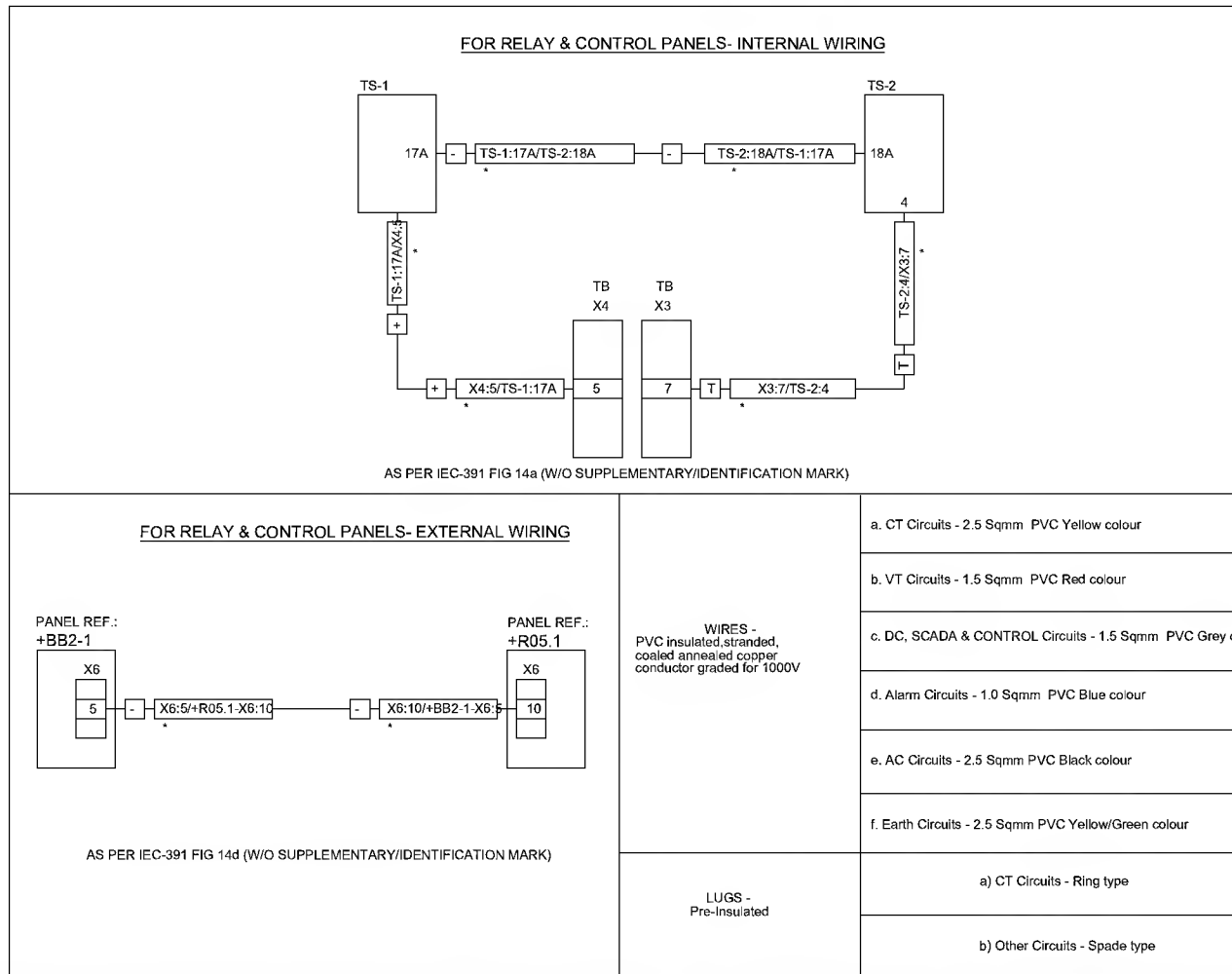
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NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK

LETTERS ON YELLOW TUBE

3.2 mm for 1.5 sq mm wires and

4.2 mm for 2.5 sq mm wires

(As per 31-TMSS-1, REV 0)

NOTE:3 STARTING POINT OF THE

FERRULE LEFT TO RIGHT

AS-BUILT BY _____ DATE _____ CONTRACT NO. 1113113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

FERRULE AND WIRING DETAILS
132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323001	014 015	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

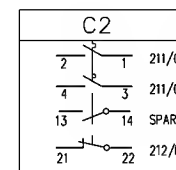
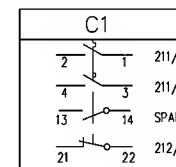
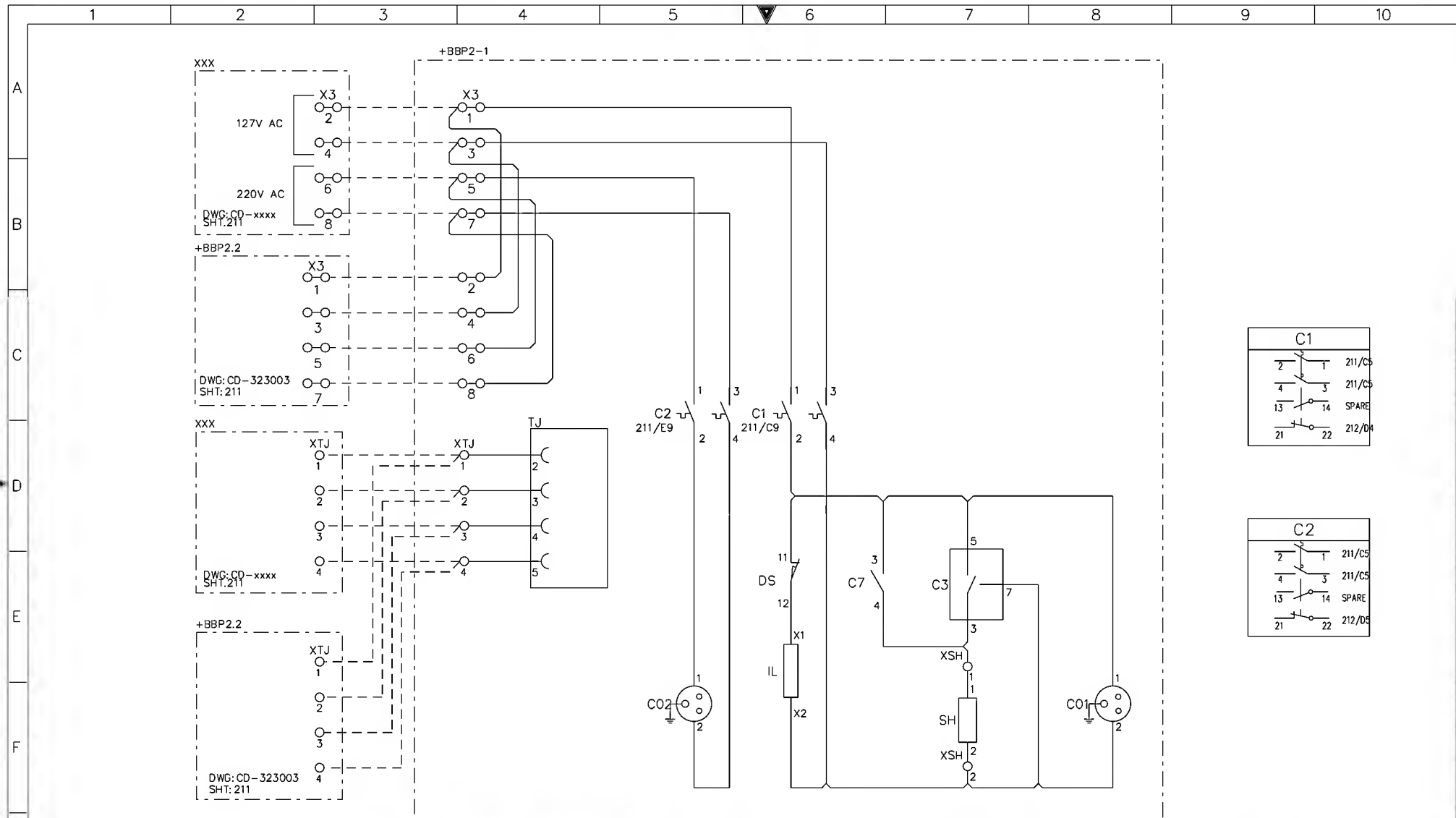
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ABB

PROTECTION & SUBSTATION
AUTOMATION

MANUFACTURER	SCHEMATICS DWG.NO	PANEL DESCRIPTION	PANEL REFERENCE
		SS 8709 13.8KV RELAY PANELS	
	CD-322952	13.8KV Capacitor Bank-1 Protection Panel	+CBP-1
	CD-322954	13.8KV Capacitor Bank-2 Protection Panel	+CBP-2
	CD-322956	13.8KV Capacitor Bank-2 Protection Panel	+CBP-3
	CD-322958	13.8 KV ACCS PANEL	+ACCS
	CD-322962	13.8KV ACSE PANEL	+ACSE
	CD-322968	13.8KV Under Voltage Load Shedding Panel	+UVLS
	CD-322964	13.8KV Under Frequency Load Shedding Panel-1	+UFLS01
	CD-322966	13.8KV Under Frequency Load Shedding Panel-2	+UFLS02

AS-BUILT by _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		DRAWING REFERENCES			الشركة الوطنية لنقل الكهرباء National Grid sa		
01 13 49 FACTORY ASBUILT			DRAWN BY RIZ		CHECKED BY KVR		132KV BUSBAR PROTN,MAIN-2 CU PANEL +BBP2-1			INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.		
00 13 04 FOR APPROVAL			DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			016 211 01		
REV. NO. DATE DESCRIPTION			OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			- C421 CD-323001 NG/D2-D (2012/01) NGD200		

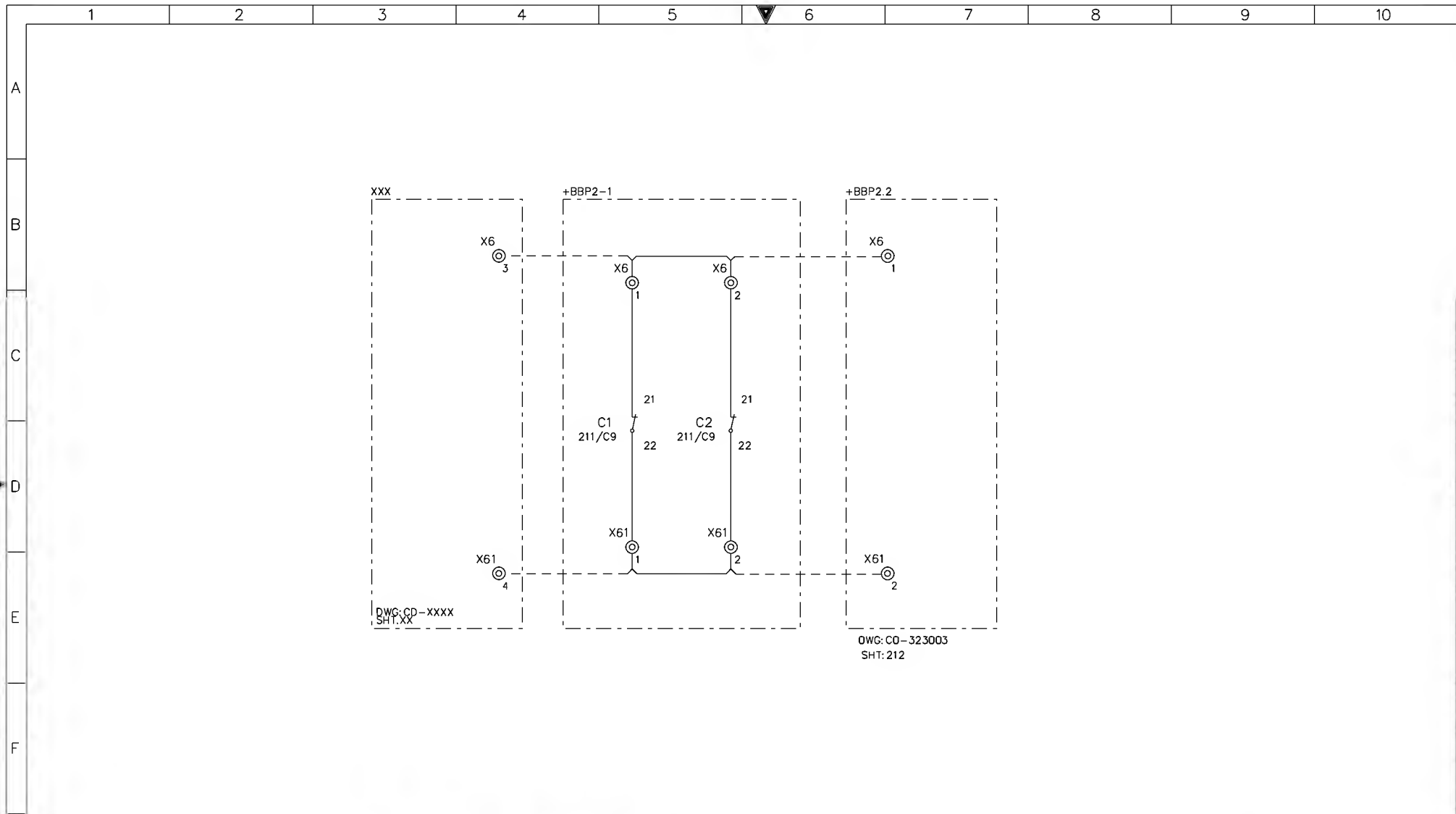


AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		AC SUPPLY FOR ILLUMINATION & POWER SOCKET			الشركة الوطنية لنقل الكهرباء		
DRAWN BY RIZ CHECKED BY KVR			DATE STARTED 24.01.2013		DATE COMPLETED _____		132KV BUSBAR PROT.N.MAIN-2 CU PANEL +BBP2-1			National Grid sa		
DATE STARTED 24.01.2013			DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX PLANT NO. DRAWING NUMBER			SHEET NO. REV. NO.		
PRG. DEPT. CTPD ENG. DEPT. AUT-PSAC			RİYADH SAUDI ARABIA		- C421		CD-323001			211 212 01		
REV. NO. DATE DESCRIPTION			FACTORY ASBUILT		FOR APPROVAL		NG/D2-D (2012/01)			NGD200		

NG/D2-D (2012/01)

NGD200

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AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

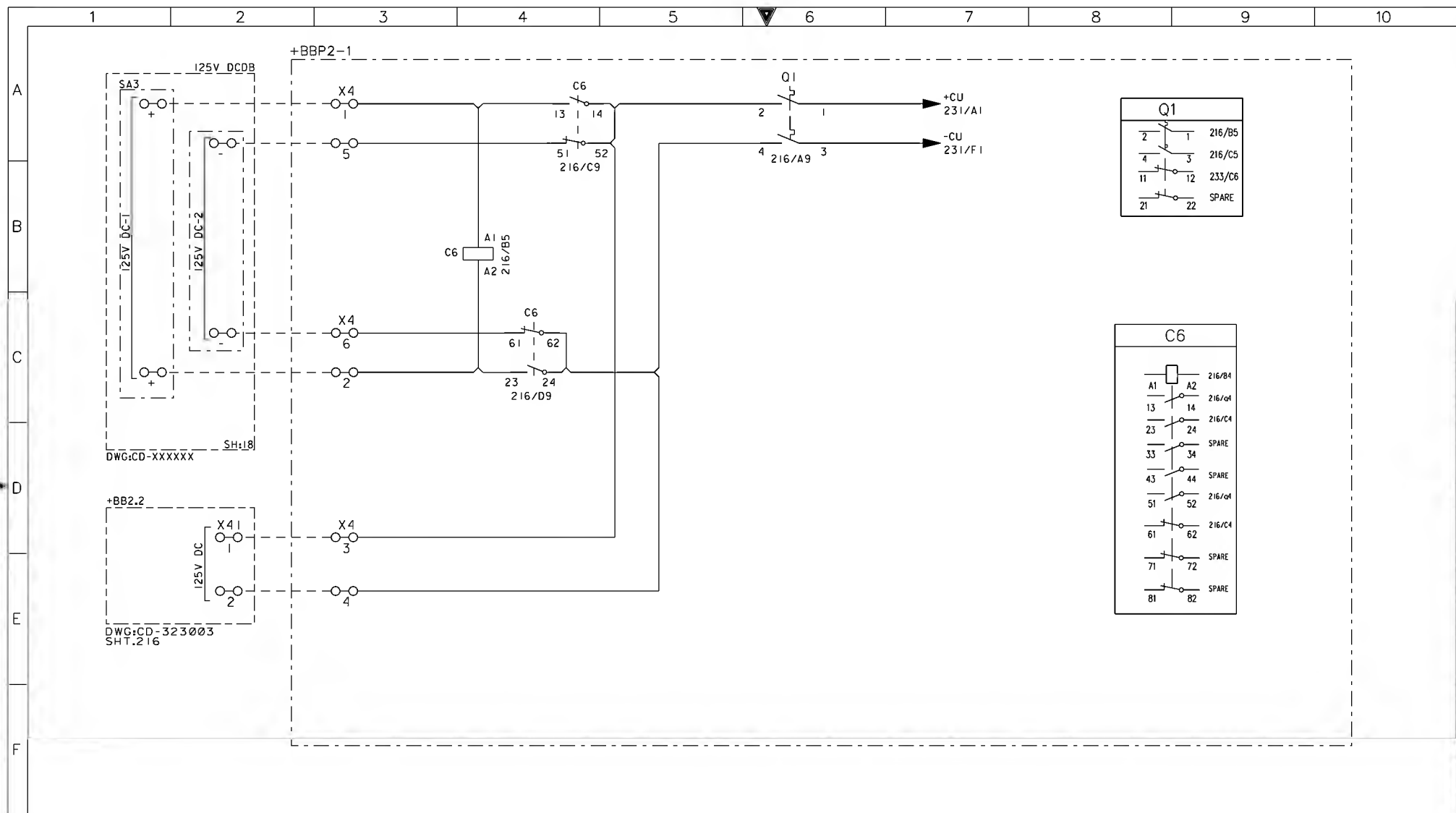
AC SUPPLY AUXILIARY CONTACTS
132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323001	212 216	01

DMS VECTOR NG0200



AS-BUILT BY _____ DATE _____

CONTRACT NO. 1113113/00

JOB ORDER NO. S-13656


DC SUPPLY DISTRIBUTION

132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323001	SHT CONT 216 231	01

NG/D2-D (2012/01)

NGD200

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FACTORY ASBUILT

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FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

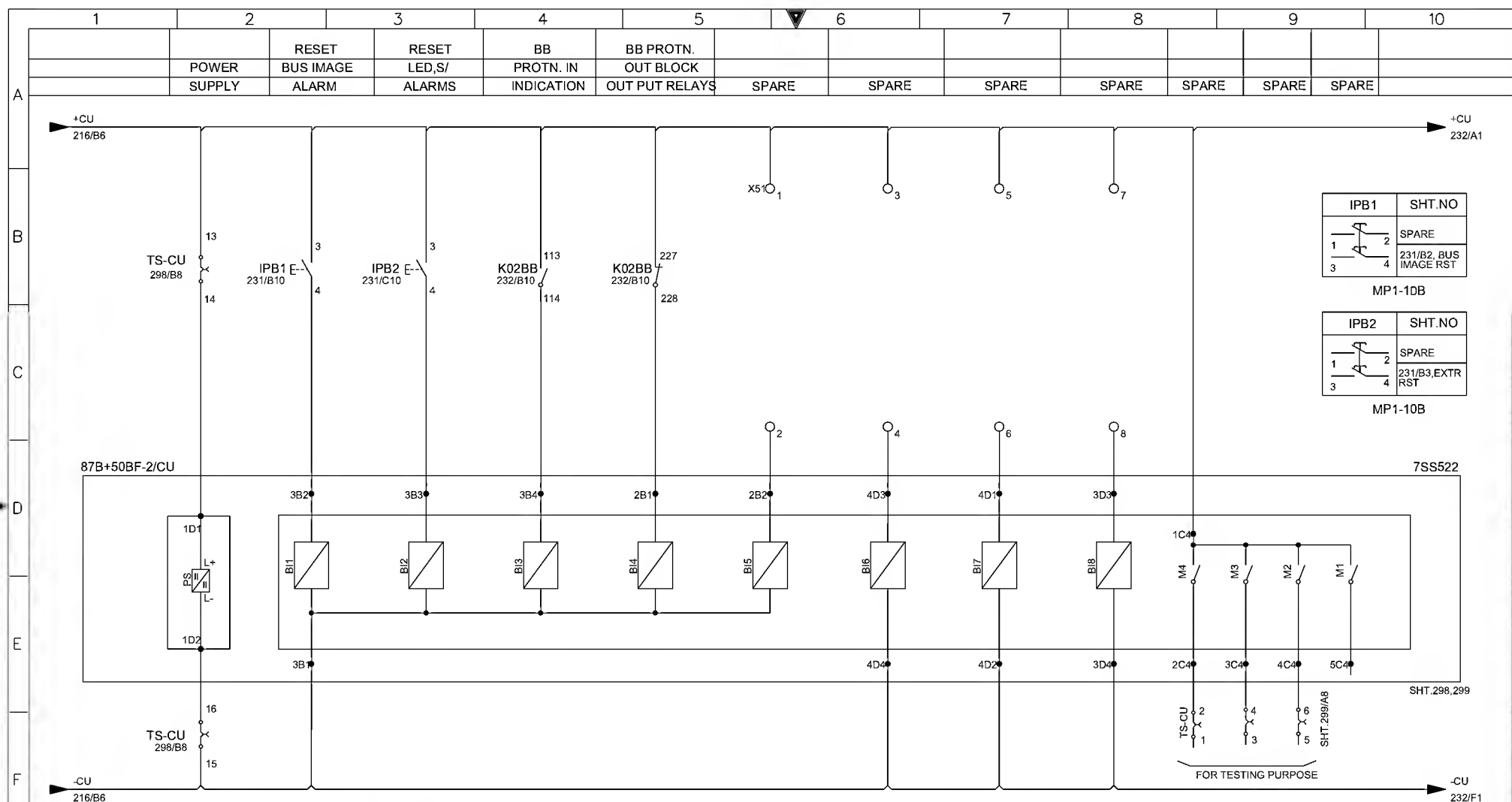
DATE COMPLETED _____

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

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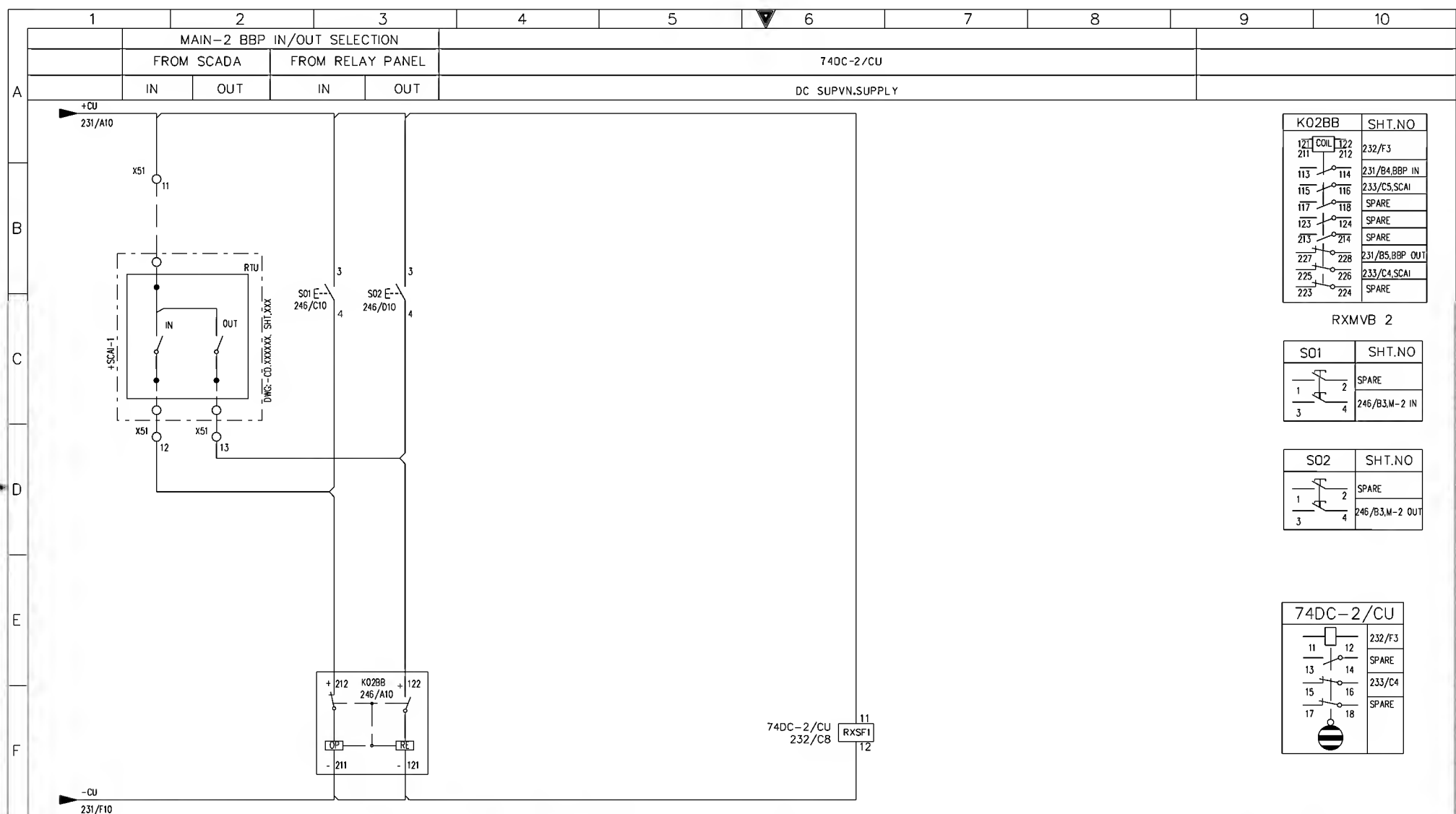


AS-BUILT BY	DATE	CONTRACT NO. 1113113/00	JOB ORDER NO. S-13656	87B+50BF-2/CU PROTN.RELAY - BINARY INPUTS	الشركة الوطنية لنقل الكهرباء National Grid sa
01	13 49	FACTORY ASBUILT	DRAWN BY RIZ CHECKED BY KVR	132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1	نقل الكهرباء
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013 DATE COMPLETED	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	National Grid sa
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC	RIYADH SAUDI ARABIA	National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	SHT. CDNT.	REV. NO.
-	C421	CD-323001	231	232	01

NG/D2-0 (2012/01)
NGD200

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K02BB	SHT.NO
121 COIL 122	232/F3
113 114	231/B4.BBP IN
115 116	233/C5.SCAI
117 118	SPARE
123 124	SPARE
213 214	SPARE
227 228	231/B5.BBP OUT
225 226	233/C4.SCAI
223 224	SPARE

RXMBV 2

S01	SHT.NO
1 2	SPARE
3 4	246/B3.M-2 IN

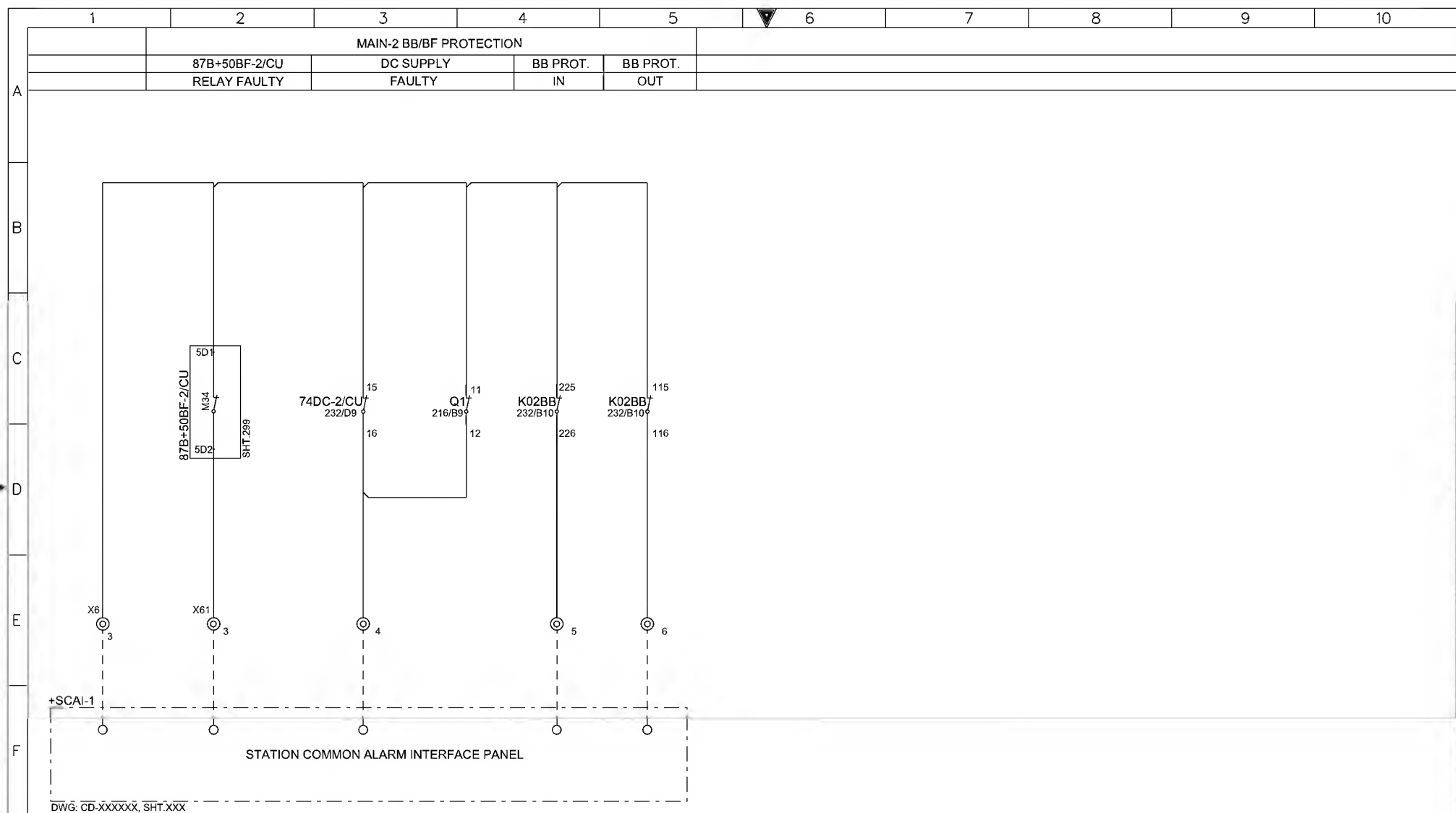
S02	SHT.NO
1 2	SPARE
3 4	246/B3.M-2 OUT

74DC-2/CU	
11 12	232/F3
13 14	SPARE
15 16	233/C4
17 18	SPARE

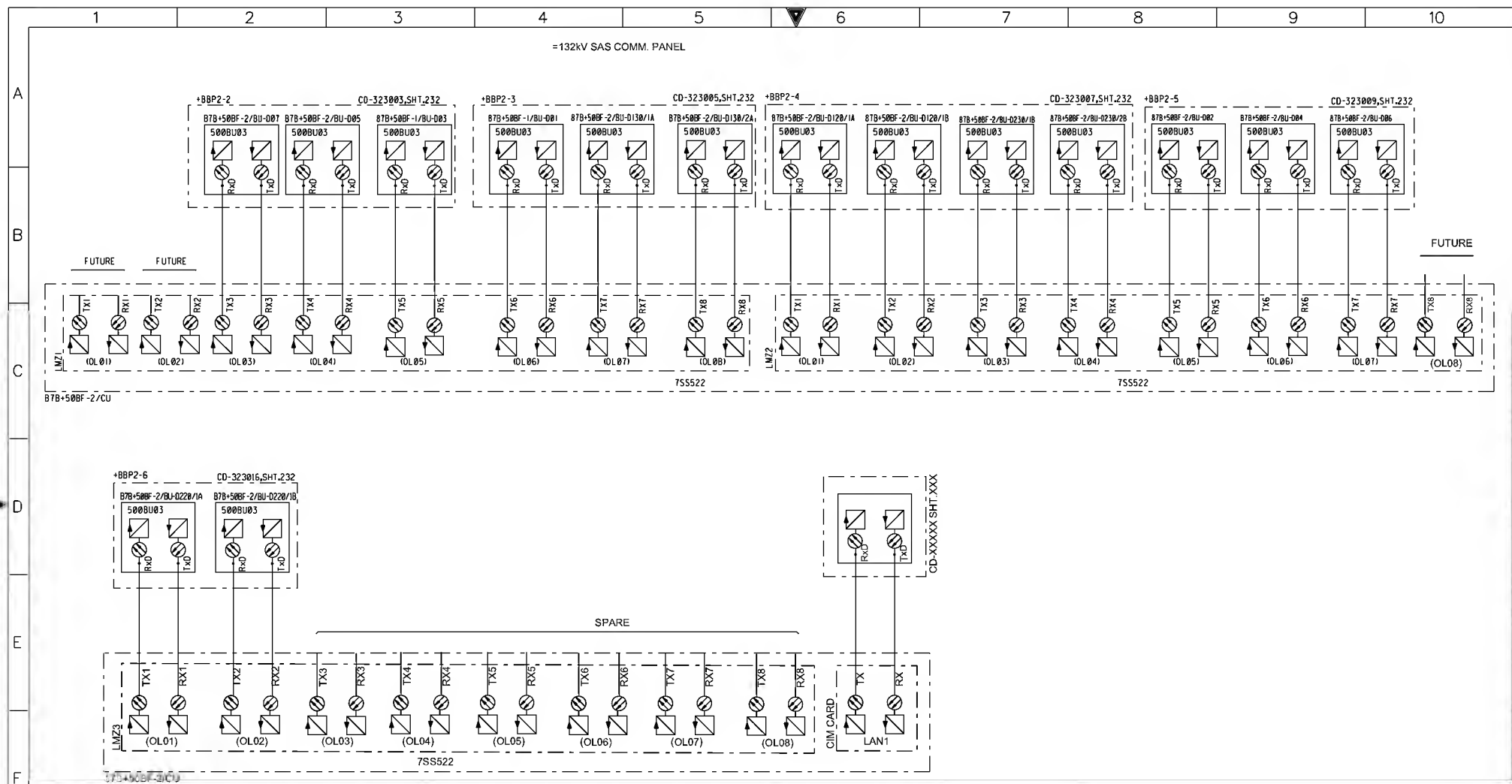
AS-BUILT BY	DATE	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	BBP IN/OUT SELECTION CKT.	الشركة الوطنية لنقل الكهرباء	نقل الكهرباء
01 13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR	132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1	INDEX	PLANT NO.
00 13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	DRAWING NUMBER	SHEET NO.
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC	CD-323001	SHT CONT.
				RIYADH SAUDI ARABIA	- C421	232/233
						01


NG/02-0 (2012/01)

VECTOR NG0200



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	STATION COMMON ALARM		الشركة الوطنية لنقل الكهرباء National Grid sa			
01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR	132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		-	C421	CD-323001	SHT 233
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC	RIYADH SAUDI ARABIA		- C421		CD-323001	233
									234	01

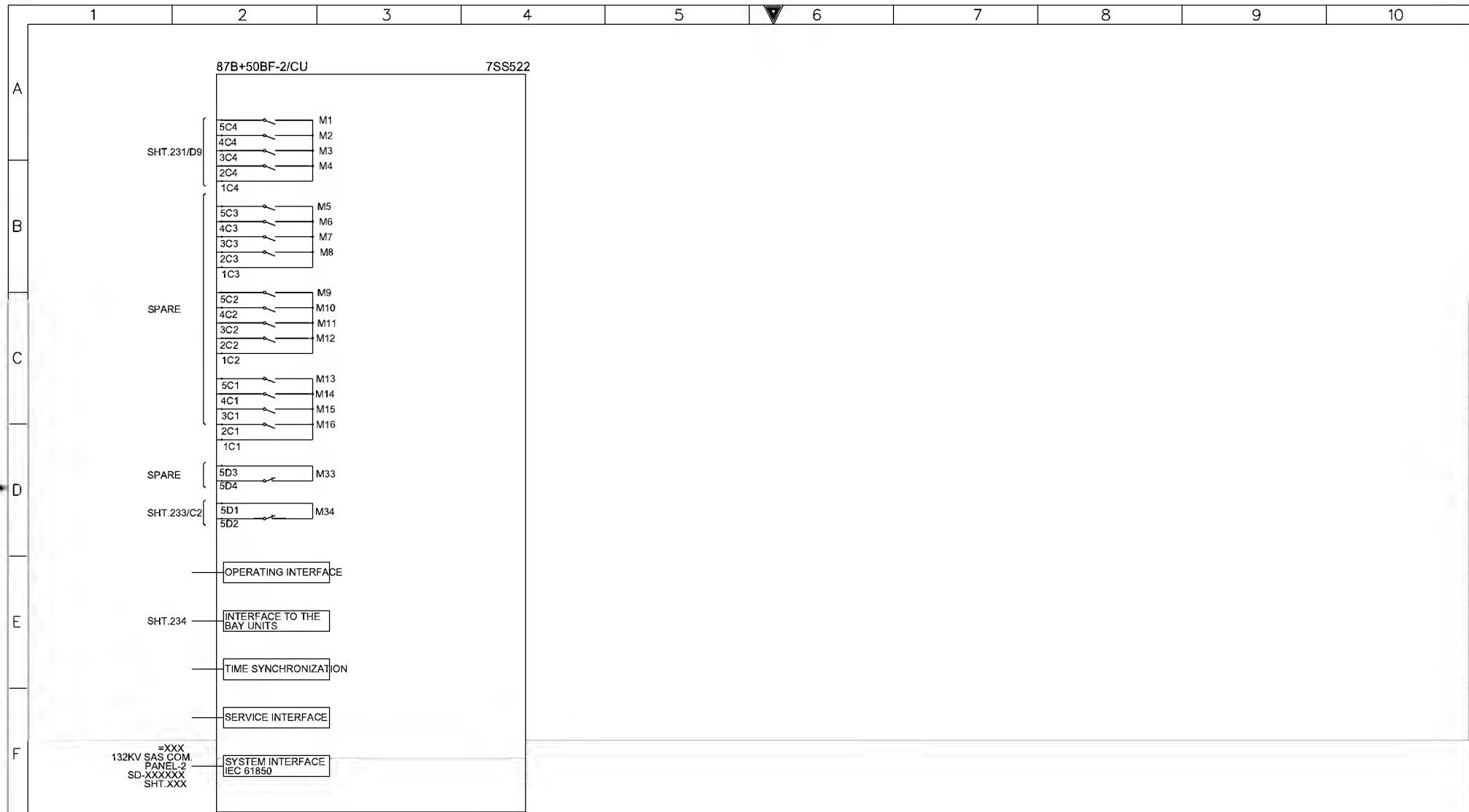


AS-BUILT BY _____		DATE _____		CONTRACT NO. 1113113/00		JOB ORDER NO. S-13656		87B+50BF-2/CU COMM. TO BAY UNITS				<div><div>الشركة الوطنية لنقل الكهرباء</div><div></div></div> <div>National Grid sa</div>								
G	01	13 49	FACTORY ASBUILT			DRAWN BY RIZ		CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1										
	00	13 04	FOR APPROVAL			DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY										
	REV. NO.	DATE	DESCRIPTION			OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA								
												- C421		CD-323001		234 298		01		
																			NG/D2-D (2012/01)	
																			DMS VECTOR	
																			NGD200	

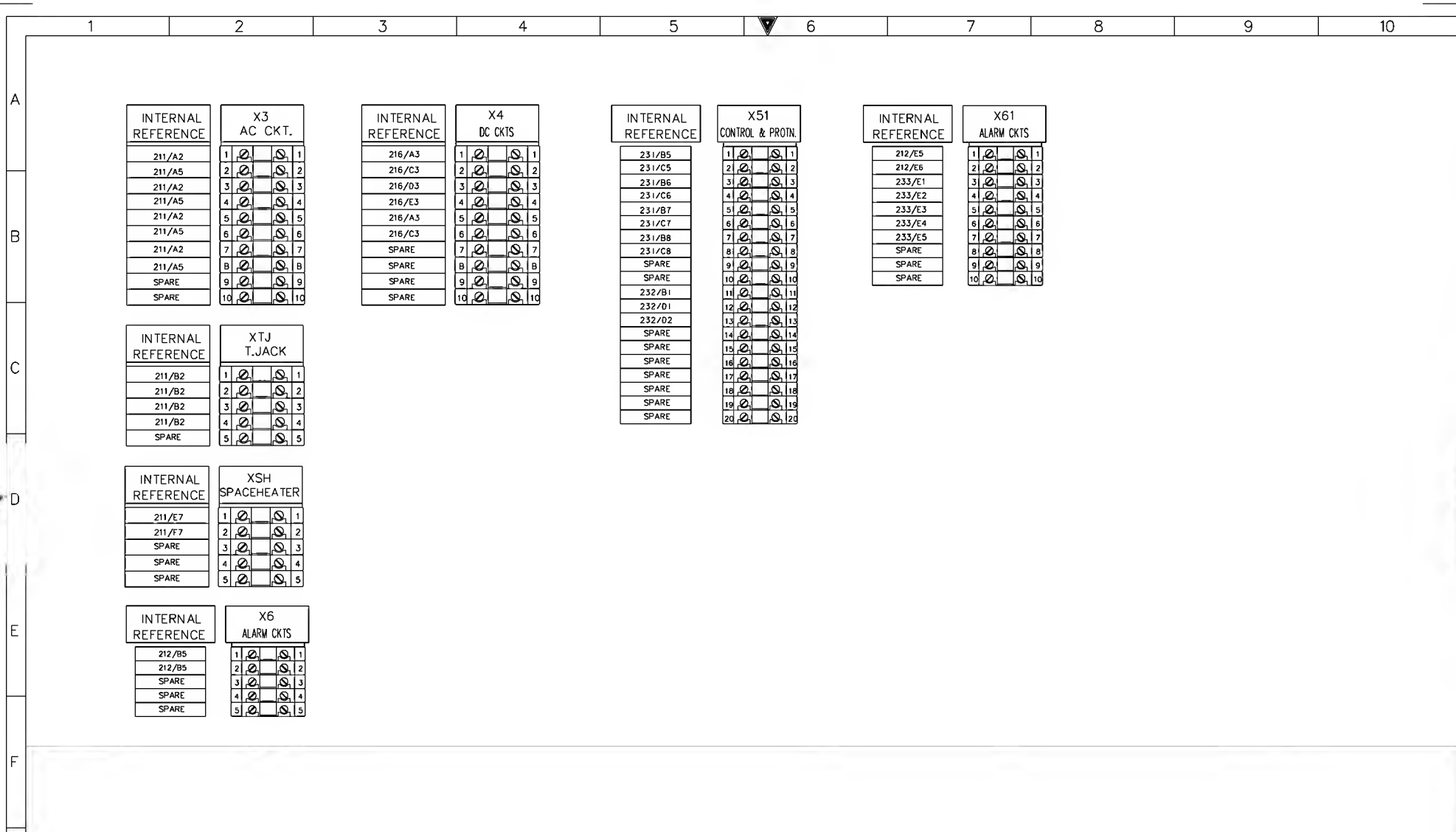
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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		87B+50BF-2/CU INTERNAL DIAGRAM		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
01 13 49			DRAWN BY RIZ		CHECKED BY KVR		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1		INDEX		PLANT NO.	
00 13 04			DATE STARTED 24.01.2013		DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		DRAWING NUMBER		SHEET NO.	
REV. NO.			PRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		CD-323001		SHT CONT.	
DESCRIPTION									- C421		298/299	
											REV. NO.	
											01	



AS-BUILT BY _____ DATE _____			CONTRACT NO. 1113113/00		JOB ORDER NO. S-13656		87B+50BF-2/CU INTERNAL DIAGRAM				الشركة الوطنية لنقل الكهرباء			
DRAWN BY RIZ CHECKED BY KVR			DATE STARTED 24.01.2013		DATE COMPLETED _____		132KV BUSBAR PROTN.MAIN-2 CU PANEL +BBP2-1				National Grid sa			
FOR APPROVAL			PRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.			
REV. NO.	DATE	DESCRIPTION	RIYADH		SAUDI ARABIA		-	C421	CD-323001	299/301	01			



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01 13 49 FACTORY ASBUILT

00 13 04 FOR APPROVAL

REV. NO. DATE DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED

OPRG. DEPT. CTPO ENG. DEPT. AUT-PSAC

TERMINAL BLOCKS +BB2-1

132KV BUSBAR PROT.N.MAIN-2 CU PANEL +BBP2-1

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323001	301	01

NG/D2-0 (2012/01)
DMS VECTOR NG0200